Technical Analyses, Tools and Data that Support Measurable Objectives

Revised 10/7/2013

CVFPP Goal	Objective Topics	Potential Metrics	Analyses, Tools, and Data that Support Measurement of Objectives: Central Valley Hydrology	Hydraulic Models	Delta Hydrodynamic Models	Flood Damage Analysis Models	2-D Flood Bypass Models	Life Safety Analysis	Climate Change Vulnerability Analysis	Analysis of Long-Term O&M Costs	Floodplain Restoration Opportunities Analysis (FROA)	Medium- and Fine-scale vegetation maps	Passage Assessment Database	Frequently Activated Floodplain Analysis	Targeted Species Planning	Other Data Gathering Specific to Metric
Improve Flood Risk Management	**1. People and Property at Risk –** Reduce flood risks to people and property within floodplains protected by the State Plan of Flood Control															
	1a. Urban Flood Protection	1) Annual probability of flooding (% probability) in urban areas	X	X	X	X										
		2) Risk to human life, health, and safety (%) in urban areas	X	X		X		X								
		3) Damages to property and infrastructure ($) in urban areas	X	X		X										
	1b. Small Community Flood Risk Reduction	1) Annual probability of flooding (% probability) for small communities	X	X		X										
		2) Risk to human life, health, and safety (%) in small communities	X	X		X		X								
		3) Economic damages ($) to small communities	X	X		X										
		4) Number of small communities with 100-year flood protection	X	X		X										
		5) Number of nonstructural actions in small communities				X										X
	1c. Rural-agricultural Area Flood Risk Reduction	1) Annual probability of flooding (%) in rural-agricultural areas	X	X	X	X										
		2) Risk to human life, health, and safety (%) in rural areas	X	X		X		X								
		3) Damages to property, crops, infrastructure ($) in rural areas	X	X	X	X										
		4) Potential miles of rural levee that are accessible under all weather conditions														X
		5) Number of nonstructural actions implemented within rural-agricultural floodplains														X
	2. Flood System Flexibility – Improve the ability of the flood management system to adapt to changing conditions (hydrologic, social, political, regulatory, or ecological conditions)															
	2a. Flood System Flexibility	1) Increased peak flood volume (acre-feet) and flow (cfs) that can be accommodated in the flood management system (within channels, bypasses, floodplains, or reservoirs)	X	X	X		X		X							
		2) Ability to achieve similar results for metrics identified in 1a, 1b, and 1c under alternate future conditions (for example, achievements given 5%, 15%, and 30% increases in flood volume)	X	X	X	X	X	X	X							

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Improve Flood Risk Management		3) Increase in ability to actively (versus passively) control the movement of flood flows through the flood management sytstem (ability to manage the timing and magnitude of flood peaks in real time, through operable features or control systems including dams, weirs, gates, etc.)		X			X		X							
		4) Increased flood warning time (% or hours/days) to support real-time operational flexibility and/or flood preparedness						X								X
	3. Flood System Resiliency – Improve the ability of the flood management system to continue to function and recover quickly after damaging floods															
	3a. Flood System Resiliency	1) Reduction in economic damages ($ or %) with added resiliency measures in place	X	X	X	X										
		2) Number of physical resiliency measures (levees that withstand overtopping, modifications to infrastructure to segment floodplains, modifications to critical facilities, etc.) implemented in high risk areas (areas with deep or rapid flooding, dense development, etc.)														X
		3) Number of flood recovery plans in urban areas, and % of urban population covered by these plans.														X
		4) Number of flood recovery plans in non-urban areas, and % of non-urban population covered by these plans.														X
		5) Number of flood insurance policies within floodplains protected by the SPFC														X
	4. Wise Floodplain Management – Wisely manage floodplains protected by the SPFC to manage residual risks, particularly in areas of deep or rapid flooding															
	4a. Wise Floodplain Management	1) Total acres or % of floodplains with flood-compatible land uses preserved (through easements or other means)										X				X
		2) Number of land-use plans consistent with State guidance related to floodplain risks and functions (e.g., Urban Level of Protection Criteria, Office of Planning and Research guidance, "Implementing California Flood Legislation into Local Land Use Planning: A Handbook for Local Communities," etc.)														X

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		3) Number of nonstructural actions implemented within floodplains protected by the SPFC for the purpose of residual risk management (e.g., flood emergency preparedness plans, early warning systems, easements or zoning changes, etc.)														X
		4) Number of flood emergency preparedness plans in urban areas, and % of urban population covered by these plans.														X
		5) Number of flood emergency preparedness plans in non-urban areas, and % of non-urban population covered by these plans.														X
Promote Ecosystem Functions	**5. Ecosystem Processes –** Improve and enhance natural dynamic natural hydrologic and geomorphic processes															
	5a. Inundated Floodplain	1) Total amount (acres, expected annual habitat (EAH) units) with sustained spring and 50-percent frequently activated floodplain	X	X							X	X		X		
		2) Total amount of expected annual inundated floodplain habitat (acres)		X							X	X		X		
	5b. Riverine Geomorphic Processes	1) Natural Bank—total length (miles)														X
		2) River Meander Potential—total amount (acres)														X
	6. Habitats – Increase and improve quantity, diversity, quality, and connectivity of riverine aquatic and floodplain habitats															
	6a. Shaded Riparian Aquatic (SRA) Cover	1) Shaded Riverine Aquatic Cover and Bank and Vegetation Attributes of SRA Cover—total length (miles)										X				X
		2) Total length and % of bank affected by flood projects that incorporate SRA attributes										X				X
	6b. Riparian	1) Habitat Amount—total amount and total amount on active floodplain (acres)										X		X		
		2) Habitat Connectivity -- median patch size (acres)										X				
	6c. Marsh	1) Habitat Amount—total amount and total amount on active floodplain (acres)										X		X		
	6d. Floodplain Agriculture	1) Habitat Amount—total amount (acres) of floodplain agriculture providing habitat for target species										X			X	
	7. Species – Contribute to the recovery and stability of native species populations and overall biotic community diversity															
	7a. Threatened and Endangered Target Species	Metrics specific to 17 targeted species are currently under development													X	X
	8. Stressors – Reduce stressors related to the development and operation of the flood management system that negatively affect important species															

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	8a. Revetment	1) Revetment Removed to Increase Meander Potential and/or Natural Bank (without negatively affecting flood safety)—total length (miles)														X
	8b. Levees	1) Levees Relocated to Reconnect Floodplain or Improved to Eliminate Hydraulic Constraints on Restoration (where consistent with flood risk management)—total length (miles)												X		X
		2) Miles and acres of flood channel with flood flow capacity that allows for riparian forest and safe conveyance of flood flows	X	X			X					X				
	8c. Fish Passage Barriers	1) Number of fish passage barriers within the flood management system that are modified or removed											X			
	8e. Invasive Plants	1) Invasive Plant-Dominated Vegetation --total area reduced (acres)										X				
Improve Operations & Maintenance	**9. Long-term Cost of O&M –** Reduce the long-term cost of SPFC O&M through more sustainable physical conditions and improved facility reliability															
	9a. Cost of O&M	1) Reduction in long-term O&M costs ($ or %)								X						
		2) Reduction in long-term repair costs ($ or %)								X						
		3) Reduce conflicts between ecosystem processes and flood system maintenance										X				X
	10. Consistent and Efficient O&M Practices – Develop SPFC maintenance practices that reduce costs, improve system performance, and promote ecosystem functions															
	10a. Efficiency and Consistency	1) Reduction in long-term O&M costs ($ or %)								X						
		2) Improved system performance or reliability				X				X						
		3) Reduce the number of unauthorized high and medium risk encroachments								X						
Improve Institutional Support	**11. Collaboration and Regional Governance –** Increase collaboration among flood managers, regulatory agencies, conservation planners, non-governmental organizations, agricultural and other interests															
	11a. Collaboration and Governance	1) Miles of river corridor within the SPFC Systemwide Planning Area that are covered by (a) completed Habitat Conservation Plans and/or Natural Community Conservation Plans, or (b) signed planning agreements for such plans.														X
		2) Reduction in the total number of SPFC maintaining entities (either through consolidation or formation of maintenance partnerships)														X
	12. Sustainable Funding – Improve the long-term sustainability of flood management funding															

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Improve Institutional Support	12a. Funding	1) Increase in long-term funding (a) diversity (number and type of funding sources or mechanisms in place, including general funds, bonds, assessments, etc.), and (b) consistency (annual average funding), allocated to SPFC flood management activities (including flood system improvements, operations and maintenance, emergency preparedneses and response, ecosystem functions, and floodplain management).														X
	13. Information and Tools – Improve the quality and availability of information and tools that inform flood management, and educate the public on their individual flood risk															
	13a. Information and Tools	1) Number of datasets or tools available to agencies and the public, and web-based usage of those														X
		2) Funding ($) invested in public education and community-based training programs about flood risks, preparedness, and safety														X
	14. Project Approvals – Improve the efficiency of project implementation (time and cost of approvals), and success of conservation and mitigation															
	14a. Project Approvals	1) Reduction in administrative and mitigation costs associated with permitting SPFC flood management activities (improvement projects and O&M activities)														X
		2) Reduced time to acquire permits (average days/project or reduction in average time for approvals)														X
		3) % of total acres covered by regional or programmatic permitting mechanisms														X
		4) Total acres acquired for advance mitigation purposes														X
		5) Advance mitigation acres and credits applied toward projects														X
Promote Multi-Benefit Projects	**15. Integrated Water Management –** Promote design of multi-benefit projects that integrate other resource needs (ecosystem, water supply, recreation, etc.), where feasible															
	15a. Multi-benefit Projects	1) Project funding allocated to different purposes (flood management, ecosystem functions, water supply, etc.) ($ and % of total funding)														X
		2) Number of multi-benefit flood management projects implemented														X